

# REMARKS

## I. THE CLAIM CHANGES AND NEW CLAIMS

The broadest independent claim 13 has been amended to include the features and limitations of claim 14, which limited the metal oxide that coats the silicon dioxide platelets to “containing TiO<sub>2</sub>”, and the features and limitations of claim 19, which limited the glass flux in the colorant to preferred compositions. Claims 14 and 19 have then been canceled.

The only other wording changes in claim 13 change the definition of the special-effect pigment. According to the amended claim 13 the special-effect pigment **consists of** a plurality of synthetically produced, coated plane-parallel silicon dioxide platelets, each of which **consists of** a flat silicon dioxide particle and a single layer that coats the silicon dioxide particle. This definition is partially supported by page 4, lines 10 to 11, and lines 15 to 17, of the applicants’ originally filed specification. In addition, the limitation of the coating to a single metal oxide layer that includes titanium dioxide is supported by the disclosure in the COLORSTREAM® pigment product sheets of Merck, which were filed with the amendment dated January 31, 2008.

These latter wording changes in claim 13 are not new matter because the descriptions of the special-effect pigments using their trademarks in the originally

filed claims may be replaced under USPTO rules with the description of the COLORSTREAM® pigments given by the manufacturer, Merck, in their product sheets. The composition of the metal oxide layer is further defined in dependent claims 16 and 18 and in the newly filed independent claims 23 and 25. The source of the more detailed composition information is also found in the Merck Product Sheets.

New independent claim 23 includes the features and limitations of the amended claim 13 and the previously filed dependent claim 15 and 16. Thus the special-effect pigment is limited to the COLORSTREAM® T20-02 WNT Arctic Fire pigment No. 58090 described in the Merck product sheets. Also, like claim 13, new independent claim 23 is limited to a colorant containing the preferred aluminoborosilicate glass flux compositions (GF1) disclosed on pages 5 and 6 of the originally filed specification.

Dependent claim 24 is the same as dependent claim 17 but depends on claim 23. The particle size distribution of these claims is the distribution for the COLORSTREAM® T20-02 WNT Arctic Fire Pigment No. 58090 described in the Merck product sheets.

New independent claim 25 includes the features and limitations of amended independent claim 13 and dependent claims 15 and 18. New independent claim 25 and dependent claim 13 are limited to the special effect pigment is limited to the composition of the metal layer of lot no. 992390 of the COLORSTREAM® T20-02 WNT Arctic Fire Pigment No. 58090, which is described in the Merck product sheets.

Dependent claims 15, 17, and 18 have been amended to establish the connection between the coated silicon dioxide and the previously included “particles” and to avoid confusion because of the introduction of the term “flat silicon dioxide particle” in the amended claim 13. Of course the “particles” of these dependent claims are the “coated plane-parallel silicon dioxide platelets”. The product sheets of Merck, which describe the COLORSTEAM® pigments, provide the basis for these changes in the wording of claims 15, 17, and 18.

## **II. OBVIOUSNESS REJECTIONS**

### **A. ¶ 3 of the Office Action**

Claims 13 to 14 and 20 to 21 were rejected as obvious under 35 U.S.C. 103 (a) over Eppler in US 5,783,506 in view of Coulter in US 6,586,098.

Claim 14 has been canceled, obviating its rejection on the aforesaid grounds.

Independent claim 13 has now been limited to a colorant that comprises a “GF1” aluminoborosilicate glass flux of the composition disclosed on page 5 of the originally filed specification (from canceled claim 19) and a special effect pigment that consists of the coated plane-parallel silicon dioxide platelets. Each of the coated silicon dioxide platelets are provided with a single coating layer, which consists of at least one metal oxide. The at least one metal oxide layer must include TiO<sub>2</sub> according to claim 13.

Neither Eppler nor Coulter disclosed the aluminoborosilicate glass flux with the composition according to canceled claim 19 -- and now the amended claim 13.

Accordingly since the features of claim 19 have been included in the above-amended claim 13, withdrawal of the rejection of amended claims 13 and 20 and 21 as obvious under 35 U.S.C. 103 (a) over Eppler in US 5,783,506 in view of Coulter in US 6,586,098 is respectfully requested.

#### **B. ¶ 4 and ¶ 5 of the Office Action**

Claims 15, 16, and 18 were rejected as obvious under 35 U.S.C. 103 (a) in ¶ 4 over Eppler in US 5,783,506 in view of Coulter in US 6,586,098, and further in view of Merck in "COLORSTREAM® T20-02 WNT Arctic Fire Product Information".

Claims 15 and 17 were rejected as obvious under 35 U.S.C. 103 (a) in ¶ 5 over Eppler in US 5,783,506 in view of Coulter in US 6,586,098, and further in view of Merck in "COLORSTREAM® T20-03 WNT Tropic Sunrise Product Information" (However please note that the particle size distribution information in claim 17 is disclosed in the "COLORSTREAM® T20-02 WNT Arctic Fire Product Information").

All the composition and particle size distribution limitations of the special-effect pigment in claims 15 to 18 are features of the COLORSTREAM® T20-02 WNT Arctic Fire Pigment No. 58090 and can be obtained from product sheets

describing that particular special-effect pigment of Merck.

Independent claim 13 has now been limited to a colorant that comprises a “GF1”-aluminoborosilicate glass flux of the composition disclosed on page 5 of the originally filed specification (from canceled claim 19) and a special effect pigment that consists of the coated plane-parallel silicon dioxide platelets. Each of the coated silicon dioxide platelets are provided with a single coating layer, which consists of at least one metal oxide. The at least one metal oxide layer must include  $\text{TiO}_2$  according to claim 13.

Neither Eppler nor Coulter disclosed the aluminoborosilicate glass flux of the composition according to canceled claim 19.

Claims 15, 16, 17, and 18 each depend on the amended claim 13 and thus their claimed subject matter includes the composition according to canceled claim 19 because of their dependence on claim 13.

Accordingly, withdrawal of the rejection of claims 15, 16, and 18 as obvious over under 35 U.S.C. 103 (a) over Eppler in US 5,783,506 in view of Coulter in US 6,586,098, and further in view of Merck in “COLORSTREAM® T20-02 WNT Arctic Fire Product Information” is respectfully requested.

Also withdrawal of the rejection of claims 15 and 17 as obvious over under 35 U.S.C. 103 (a) over Eppler in US 5,783,506 in view of Coulter in US 6,586,098, and further in view of Merck in “COLORSTREAM® T20-03 WNT Tropic Sunrise Product Information” is respectfully requested.

New claim 23 includes the features and limitations of the amended claim 13 plus the features and limitations of claims 15 and 16. New independent claim 25 includes the features and limitations of the amended claim 13 and the previously filed dependent claim 15 and 18.

Accordingly it is respectfully submitted that new claims 23 to 25 should not be rejected as obvious under 35 U.S.C. 103 (a) over Eppler in US 5,783,506 in view of Coulter in US 6,586,098, and further in view of Merck in "COLORSTREAM® T20--02 WNT Arctic Fire Product Information" and/or "COLORSTREAM® T20-03 WNT Tropic Sunrise Product Information".

### **C. ¶ 6 of the Office Action**

Claims 13, 14, and 19 to 22 were rejected as obvious under 35 U.S.C. 103 (a) in ¶ 6 over Cotlear de Witzmann in US 6,794,020, in view of Coulter in US 6,586,098.

Claim 13 has been amended by including the glass flux composition of claim 19 in the colorant. Claim 14 has been canceled, obviating its rejection on these grounds. Claim 19 has been canceled.

### **1. The Invention Claimed in Amended Claim 13**

The features of the amended claim 13 can be summarized as follows:

(a) a glass ceramic or glass ceramic body --- decorated with

- (b) a colorant (paint) based on a silicate metal containing
- (c) 1 to 30 wt. % of a special-effect pigment that provides a color-flop effect;
- (d) the pigment consists of plane-parallel silicon platelets and a single layer coating each platelet;
- (e) the single layer consists of at least one metal oxide;
- (f) the at least one metal oxide includes  $\text{TiO}_2$ ; and
- (g) the silicate melt comprises the aluminoborosilicate glass melt with the “GF1” composition as claimed in canceled claim 19.

## **2. The Scope and Content of the Prior Art**

Cotlear de Witzmann, et al, do disclose a glass ceramic panel providing a cooking surface that has at least one decorative coating covering at least 80 % of its upper smooth surface (see abstract). This reference is also owned by the owner of the above-identified U.S. Patent application, namely SCHOTT AG.

The purpose of the decorative coating according to Cotlear de Witzmann is to reduce the conspicuousness of usage marks and scratches caused by pots, metal rub-off and fingerprints on the surface of the glass ceramic panel (see column 4, lines 5 to 14; last paragraph of claim 1). For this purpose the decorative coating has certain preferred colors: ivory, beige, bisque or almond (claim 5) and preferred  $C^*$  and  $L^*$  values (claims 1 to 4). The coating is also provided with small openings in the form of a pattern (column 6, lines 19 to 29).

Cotlear de Witzmann uses a decorative paint to make the decorative

coating that includes a glass flux described in DE 197 21 737 and various known pigments, but which are **not** color-flop pigments. The inorganic pigments used by Cotlear de Witzmann include  $\text{ZrSiO}_4$ , pure  $\text{TiO}_2$ ,  $\text{CeO}_2$ , Zr/Sr/Cr oxides and so forth. The pigments of Cotlear de Witzmann do **not** include silicon dioxide platelets that are coated with a metal oxide. However the glass flux of the applicants' amended claim 13 and canceled claim 19 has substantially the same chemical composition as the glass flux of Cotlear de Witzmann described in column 7, lines 39 to 57.

Coulter does disclose pigment particulates or flakes each comprising an inorganic support or supporting layer that is coated with a reflective coating or layer (abstract, claim 1). The applications of the pigments mentioned in Coulter, including paints and inks, generally involve ambient or room temperature conditions, not the high temperatures experienced in a glass melt (see column 16 and the examples of Coulter).

The supporting layer material can be silicon dioxide as well as other inorganic oxides or sulfides or glass (claim 4). The reflective layer can be a metal such as aluminum, copper, silver, gold and even titanium (claim 8). Of course most materials reflect light to some extent, but metals of course have a high reflectivity (see claim 1, line 1, of Coulter).

However Coulter does **not** disclose a color flop pigment that consists of coated plane-parallel silicon dioxide platelets, each of which is a flat silicon dioxide particle that is coated with a single layer of at least one metal oxide,



wherein the metal oxide layer includes  $\text{TiO}_2$ . Coulter does **not** exemplify the reflective layer of their claim 1 that coats the support layer, as shown in fig. 1A to 1C as a titanium dioxide layer or a metal oxide layer that includes titanium dioxide, although the reference does disclose that the reflective layer can include metal oxides.

Coulter does disclose that the support layer can include titanium dioxide, which is a well-known pigment and paint ingredient in column 7, lines 20 to 36.

Coulter also discloses coatings comprising a plurality of layers in addition to the reflective layer as shown in figs. 1a to 1c including additional dielectric layers coating the reflective layer. The additional dielectric layers can include titanium dioxide, for example as disclosed in column 12, line 40.

Coulter does disclose additional interference pigments that can be mixed with the pigment particles of Coulter's invention. These additional interference pigment particles include the  $\text{TiO}_2$ -coated **mica** particles at column 16, line 46, which would be similar to the pigment used in example 6 in column 5 of Eppler. They also include pigments similar to those of other prior art of record, disclosed at column 16, line 47, of Coulter.

**However Coulter does not disclose a color flop pigment that consists of titanium-oxide coated plane-parallel silicon dioxide platelets, as claimed in applicants' claim 13 and certainly as in claims 23 and 25..**

### 3. Rationale for the Rejection

#### The Prior Art of Record Leads Away from the Claimed Invention

Cotlear de Witzmann teaches a different solution to the problem of making usage marks, fingerprints and scratches on glass ceramic articles less conspicuous. This problem is the same as that solved by the applicants' claimed invention, but Cotlear de Witzmann solves this problem in a different manner and leads one skilled in the art away from the applicants' claimed invention.

The conspicuousness of imperfections in the surface of the glass ceramic article is controlled according to Cotlear de Witzmann by controlling the color parameter C\* and the L\* parameter of the resulting coating by selection of an appropriate inorganic pigment (column 5, lines 48 to 57) and also by providing two-tone decorations and special grid patterns with different colorants (column 8, lines 14 to 18).

Cotlear de Witzmann does not provide any reason for replacing the high melting inorganic pigments that they are using with the color-flop pigments that the applicants employ as claimed in amended claim 13 and claims 20 to 22. There is no reason to expect that the color-flop pigments would provide a new solution to the same problem (the appearance of scratches, dirt and usage marks on the glass ceramic article) that is claimed in the above amended claims 13 and 20 to 22 from the disclosures in Cotlear de Witzmann. This reference teaches a

solution that uses inorganic pigments that do not provide a color-flop effect, but which do act to conceal the scratches, dirt and usage marks by means of different properties or by patterning (two-toned) surfaces.

Coulter does **not** suggest that any of their pigments would be useful for inclusion in a colorant or paint that conceals scratches, usage marks and dirt, when applied to the surface of a glass or glass ceramic article. Thus there is no reason for one skilled in the art to expect that the paint or colorant containing the interference pigments or the pigments claimed in Coulter would solve the problem disclosed in Cotlear de Witzmann, namely the problem of finding a paint that conceals usage marks on the surface on which it is applied.

Furthermore Coulter does not disclose a pigment limited to the pigment of applicants' amended claims 13, 23, and 25. Coulter does not disclose that the reflective layer coating their supporting layer can comprise  $\text{TiO}_2$ .

It is especially important to remember that the statute requires that the source of the reason for combining the references in the suggested manner in the Office Action cannot be the applicants' specification and that the prior art references and the reason must have been apparent at the time the invention was made by the inventor, i.e. at least the application date. For example, the Federal Court have often held that hindsight reconstruction of the invention by piecing together elements from the prior art does not lead to a valid obviousness rejection under 35 U.S.C. 103 (a).

“As in all determinations under 35 U.S.C. 103, the decision-maker must bring judgment to bear. It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant's

structure as a template and selected elements from references to fill the gaps". *In re Gorman*, 18 U.S.P.Q.2d 1885 (Fed. Cir. 1991).

Predictability, which is emphasized in the more recent KSR approach, is lacking here. One skilled in the art would not have been able to predict that the replacement of the particular inorganic pigment particles, such as  $\text{ZSiO}_4$ , used by Cotlear de Witzmann, which were selected to provide certain  $L^*$  and  $C^*$  values, with applicants' color-flop pigments consisting of titanium-dioxide-coated silicon dioxide platelets in the glass flux of DE '737 would provide a colorant for a glass ceramic article that would also be effective in reducing the conspicuousness of scratches and usage marks on the glass ceramic article.

There are a very large number of possible inorganic pigments because many inorganic substances are colored, although the number inorganic pigments that produce color-flop effects is limited. Since the purposes of the colorant or paint of the Cotlear de Witzmann reference and the applicants' claimed article are the same, one skilled in the art would be motivated to select replacements for the pigments of Cotlear de Witzmann that would assist in attaining the objects and purposes of Cotlear de Witzmann and also the applicants. How would one skilled in the art know that the color flop pigments would attain the desired purpose, namely the reduction of the conspicuousness of imperfections in the surface resulting from usage? It is respectfully submitted that the one skilled in the art would not know to select the color flop pigments as claimed in claim 13 without the guidance provided in the applicants' specification.

**Otherwise** if the pigments are merely selected for the decoration based

on only aesthetic reasons as suggested on page 11 of the Office Action, the result in general would be an article that is modified so that it cannot perform its intended function because it would no longer conceal usage marks, which is not permitted under 35 U.S.C. 103 (a). See for example, M.P.E.P. 2143.01. V, where it states that the proposed modification under 35 U.S.C. 103 (a) that is necessary to arrive at the claimed invention cannot modify the invention disclosed in the primary reference so that it cannot perform its intended function, which in this case is the reduction of the conspicuousness of the usage marks and scratches on the article.

This situation is analogous to the situation in *In re Baird* in which the claims were limited to a particular species compound that was only one of a very large number of disclosed prior art compounds and the disclosed examples led one skilled in the art away from the species compounds. See M.P.E. P. 2144.05. A case of *prima facie* obviousness under 35 U.S.C. 103 (a) cannot therefore be established by the reasoning on page 11 of the Office Action.

The fact that the number of color flop pigments may or may not be comparatively limited is not relevant because the prior art of record does not direct one skilled in the art to using color flop pigments to solve the applicants' problem and also the problem of Cotlear de Witzmann.

#### Colorants Containing Mica Flakes make Usage Marks More Conspicuous

In fact, mica flakes known by the tradename, IRIODIN®, have previously been used in ceramic colorants for glass and glass ceramic surfaces. However

instead of acting to conceal usage marks, it is known in that art that they actually make them more conspicuous perhaps because of the highly reflective nature of the mica flakes. This latter effect is disclosed on page 2, lines 17 to 30, of the applicants' originally filed specification. Thus one skilled in the art would find the effectiveness of the applicants' colorant containing the titanium dioxide coated silicon flakes surprising, the opposite of obvious.

The Stable Formation of the Colorant of Claim 13 is Surprising

Coulter does **not** disclose an example or an application in which metal oxide-coated silica flakes are included in a glass melt that experiences high temperatures. The applications described in Coulter do not include specific examples and applications in which their reflective flakes are subjected to the high temperatures necessary to disperse them in a glass melt. Coulter discloses applications for the reflective flakes at column 16, lines 25 to 32, where Coulter states as follows:

"The flake-based pigments of the invention are useful in a variety of applications such as paints, inks, coating compositions, extrusions, electrostatic coatings, glass, and ceramics. For example, the pigments of the invention may be easily and economically utilized in colorants for various applications by interspersing the pigment flakes into liquid media used as paints or inks, which can subsequently be applied to various objects."

In other words, the reflective flakes are used in paints or inks together with organic materials, such as organic dyes as disclosed in column 15, lines 34 to 41, which are not disclosed as being exposed to high temperatures. The Office

Action on page 10 states that the flake-based pigments are useful “in” glasses and ceramics as colorants and refers to the quoted section above, but Coulter never states that the pigments are incorporated in a glass composition in column 16. One would only interpret this disclosure as stating that a paint (possibly including organic ingredients such as an adhesive) containing the pigments of Coulter dispersed in it could be applied to a variety of substrates including glass substrates.

There is no disclosure in Coulter that would suggest to one of ordinary skill in the glass arts that their pigments could successfully withstand the high temperatures that they would experience when they are dispersed in a glass melt. Many of the inorganic supporting materials mentioned in claim 4 of Coulter are inorganic oxides that are commonly used in glass batches and would be expected to melt in a glass melt and change its composition, but would not be expected to remain intact in the resulting solidified glass piece so that they could provide a reflective action or color-flop effects expected from Coulter.

In fact, one skilled in the art would not expect the titanium dioxide coated silicon flakes to remain intact when placed in a glass melt or glass flux, but would expect them to dissolve in the melted glass batch. The accompanying Technical Data Sheets of Merck teach that the titanium dioxide silicon dioxide flakes of applicants’ pigment are only heat stable up to 230°C. Thus it is surprising that the colorant can be made with the glass flux of US ‘020 and the COLORSTREAM® Arctic Fire pigments and that it can be used to make a decoration on the glass ceramic or glass body, which can be subject to high heat loads as claimed in

amended claim 13 and which can still provide a color-flop effect.

In addition, note the disclosures in Eppler regarding the difficulties involved in incorporating inorganic oxide pigments in glass frit or glass flux compositions at column 1, lines 25 to 44. Eppler teaches that the inorganic pigments or pearlescent pigments often dissolve in a glass melt of the stated compositions. Eppler solved this problem by using mica based pigments and taking special measures as disclosed in column 2 of this US Patent.

The disclosures of Eppler taken together with Cotlear de Witzmann and Coulter clearly lead one skilled in the art away from the claimed invention.

Thus on the basis of the prior art of record one skilled in the art would expect that the coated flakes would dissolve in the melted glass batch and that the resulting solidified body would **not** exhibit a color-flop effect and thus would not help conceal usage or scratch marks on the decorated article.

The applicants' surprising results may be due to the special glass flux composition of canceled claim 19 that is used together with the titanium dioxide coated silicon flakes and that is now included in claim 13.

For the aforesaid reasons withdrawal of the rejection of amended claims 13 and 20 to 22 under 35 U.S.C. 103 (a) over Cotlear de Witzmann in US 6,794,020, in view of Coulter in US 6,586,098, with or without Eppler, is respectfully requested.

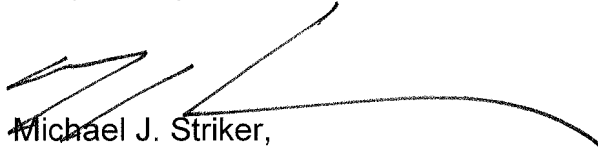
Also it is respectfully submitted that new claims 23 to 25 should not be rejected under 35 U.S.C. 103 (a) over Cotlear de Witzmann in US 6,794,020, in view of Coulter in US 6,586,098, with or without Eppler.



Should the Examiner require or consider it advisable that the specification, claims and/or drawing be further amended or corrected in formal respects to put this case in condition for final allowance, then it is requested that such amendments or corrections be carried out by Examiner's Amendment and the case passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing the case to allowance, he or she is invited to telephone the undersigned at 1-631-549 4700.

In view of the foregoing, favorable allowance is respectfully solicited.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Michael J. Striker", with a long horizontal flourish extending to the right.

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